

REMARKS/ARGUMENTS

The present invention provides a method, apparatus, and program product for dynamically managing a computing complex during a utility interruption. More specifically, the present invention provides an automated method, apparatus, and computer-readable program to manage the selected power down of devices within an information technology computing complex when the loss of conventional utility service occurs. This invention selectively shuts down systems/devices within the computing complex based on the criticality of systems/devices within the computing complex based on the criticality of the systems/devices and the current state of environment parameters (e.g., battery reserve level, temperature, time, etc) monitored within the computing complex.

Reconsideration of the application, as amended, is requested. Claims 1, 4, 9, 12, 17, 21, 27, and 29 have been amended. Claims 2 and 10 have been cancelled. No new matter has been added. Claims 1, 3-9, and 11-29 remain pending in this application.

In section 2 of the Office Action, the Examiner objects to the form of the Title. Applicants have amended the Title to address the Examiner's concerns.

In section 4 of the Office Action, the Examiner rejects claims 1-29 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. Claims 1, 4, 9, 12, 17, 21, 27, and 29 have been amended to address the Examiner's concerns and thereby overcome this rejection. Accordingly, Applicants submit that claims 1, 4, 9, 12, 17, 21, 27, and 29, as amended, are not indefinite under 35 U.S.C. 112 for failing to particularly point out and distinctly claim the subject matter of the invention.

In section 5 of the Office Action, the Examiner rejects claim 9 under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. In response,

Applicants have amended claim 9 to now add the limitation of “tangible” for the computer readable media.

In section 7 of the Office Action, the Examiner rejects claims 1, 5, 7, 9, 13, 15, and 29 under 35 U.S.C. 102(e) as being anticipated by Nakagawa, U.S. Patent 6,990,593. Applicants respectfully traverse this rejection.

Nakagawa describes a system and method for Quality of Service (QoS) based server cluster power management. The method includes grouping activities within a server cluster into predefined sets; assigning a priority level to each set; identifying a server hosting a set of lower-priority activities within the cluster; receiving a power interruption signal; and diverting power reserves of the server to another server in the cluster, in response to the power interruption signal.

While Applicants agree with the Examiner that both Nakagawa and the present invention are directed to the broad concept of managing a computing complex during a utility interruption, the two inventions achieve this goal in two very different, patentably distinct ways.

While Nakagawa manages activities (i.e., jobs, or computing tasks) within the computing complex, the present invention manages servers within the computing complex. As stated in Nakagawa in column 2, lines 60-65, “The method begins in step 302, where a network administrator groups server activities into predefined sets. The predefined sets are defined by the network administrator depending upon how the administrator intends to manage power reserves within the network after a power interruption occurs“. Nakagawa further states in column 3, lines 15-18, “In step 308, the power manager 224 generates a priority list, organizing server activities based on their assigned QoS levels“. And finally, in column 3, lines 26-27, “The power manager 224 selects which of the servers 202-208 to shutdown based on the priority list”.

In contrast to Nagakawa, claim 1 of the present invention specifically states that two factors are considered when selectively powering down the servers: 1) the current state of the

operating environment parameters (the first factor); and 2) a criticality value assigned to each of the one or more computer servers (the second factor).

This second factor, a criticality factor assigned to each of the computer servers, is defined in paragraph 35 on page 13 of the Specification. Note that while both the present invention and Nagakawa shut down servers, the decision on what servers to shut down is determined by a priority level assigned to groups of activities in the case of Nagakawa, and a criticality value assigned to individual servers in the case of the present invention. Thus, while Nagakawa bases its shutdown decisions based on QoS levels (i.e., operational priority levels) assigned to “activities” running on the servers, the present invention bases its shutdown decisions on priority levels assigned to “servers”. Thus, Nagakawa does not provide the necessary claim element of a criticality value assigned to each of the one or more computer servers.

Further, Nagakawa does not provide the necessary claim element of powering down the servers based on the current state of the operating environment parameters (i.e., the first factor). In the current Office Action, the Examiner states that this element is provided by Nagakawa in column 3, lines 26-40. However, the passage cited by the Examiner refers only to shutting down servers based on the priority list assigned to groups of activities, which has already been discussed above (i.e., the second factor), and makes no mention whatsoever of environment parameters.

Environment parameters are defined within the Specification of the present invention on page 13, paragraph 34 which states: “In the illustrated example, centralized load shedding manager 16 begins by continuously monitoring environment parameters 56 within the computing complex. In the illustrated example, three such parameters include, but are not limited to: current UPS remaining battery power (in minutes) 58, ambient temperature 60, and current time 62”.

Thus, with regard to the claim element of “selectively powering down one or more of the computer servers based on the current state of the operating environment parameters and a criticality value assigned to each of the one or more computer servers”, Nakagawa does not assign criticality values to servers (it assigns them to activities), and Nakagawa does not provide any operating environment parameters whatsoever upon which to base the shutdown decision. As a result, Applicants respectfully submit that claim 1 is in condition for allowance.

Claims 5 and 7 depend directly from claim 1, which for reasons stated above, is now submitted as being allowable. Thus, Applicants also submit that claims 5 and 7 are also now in condition for allowance.

Claim 9 also contains the same claim element found in claim 1 (i.e. selectively powering down one or more of the computer servers based on the current state of the operating environment parameters and a criticality value assigned to each of the one or more computer servers), and is submitted as allowable for the same reasoning presented above with regard to claim 1.

Claims 13 and 15 depend directly from claim 9 which, for reasons stated above, are now submitted as being allowable. Thus, Applicants also submit that claims 13 and 15 are also now in condition for allowance.

Claim 29 also contains the same claim element found in claim 1 (i.e. selectively powering down one or more of the computer servers based on the current state of the operating environment parameters and a criticality value assigned to each of the one or more computer servers), and is submitted as allowable for the same reasoning presented above with regard to claim 1.

In section 9 of the Office Action, the Examiner rejects claims 2 and 10 under 35 U.S.C. 103(a) as being unpatentable over Nakagawa, U.S. Patent 6,990,593, in view of

Langer et al., U.S. Patent 5,381,554 (hereinafter “Langer”). In response, Applicants cancel claims 2 and 10 without prejudice.

In section 10 of the Office Action, the Examiner rejects claims 3, 4, 8, 11, 12, and 16 under 35 U.S.C. 103(a) as being unpatentable over Nakagawa, U.S. Patent 6,990,593 in view of Bodas, U.S. Publication 2004/016001 (hereinafter “Bodas”). Applicants respectfully traverse this rejection.

Applicants respectfully submit that passages cited by the Examiner from the Bodas reference (i.e., paragraphs 0032, 0035, and 0053) make no mention of managing computer servers during a utility outage. In paragraph 32, the power and thermal manager (EPTM) rather generically refers to its function as: “may manage power allocated to the computer system 200 based on power and cooling capacity 260”. Paragraph 0035 mentions that the EPTM may receive information about UPS and utility status, but provides no detail on what it does with this information. Paragraph 0053 simply states that if an air conditioning system goes down, the temperature in the data center may rise, and the components in the computer systems may fail. Therefore, the data system administrators (not the EPTM) may need to reduce the power consumption levels of the computer systems by powering off one or more computer systems.

Thus, Bodas neither discloses nor suggests selectively powering down one or more computer servers based on one or more ambient temperature readings within the complex during a utility outage. Furthermore, there is no suggestion to combine the Bodas and Nakagawa references, since Bodas appears to be directed at thermal and power management during normal data center operations rather than specifically directed at monitoring thermal conditions during a utility outage.

Also, neither the Bodas or Nakagawa reference provide the necessary claim element of “selectively powering down one or more computer servers based on a criticality value assigned to each of the one or more computer servers”. Bodas neither discloses nor suggests this concept,

and Applicants submit Nakagawa is also deficient of this claim element for reasons stated above with regard to the discussion of claim 1.

As a result, Applicants submit that claims 3, 4, 8, 11, 12, and 16 are now in condition for allowance.

In section 11 of the Office Action, the Examiner rejects claims 6 and 14 under 35 U.S.C. 103(a) as being unpatentable over Nakagawa, U.S. Patent 6,990, 593, in view of Hammond et al, U.S. Patent 6,865,685. Applicants respectfully traverse this rejection.

Hammond provides an event notification system for a plurality of power supplies coupled to a computer network. In one embodiment, the notification system includes a computer system connected to the computer network, wherein the computer system includes a database, a data retrieval program, a comparison program, and an electronic notification program. The data retrieval program obtains data from the plurality of power supplies. The comparison program compares data from the plurality of power supplies with data of at least one predetermined event in order to determine if a predetermined event has occurred. The database stores information relating to an occurrence of the predetermined event and the number of the power supplies associated with the occurrence of the predetermined event. The electronic notification program sends an electronic notification, which includes information about the occurrence of the predetermined event and the number of the power supplies to which the event occurred, to one or more predetermined destinations.

Applicants respectfully submit that claims 6 and 14 depend directly from claims 1 and 9, respectfully, and must incorporate all the limitations of the base claims. Neither the Hammond or Nakagawa reference provide the necessary claim element of “selectively powering down one or more computer servers based on a criticality value assigned to each of the one or more computer servers”. Hammond neither discloses nor suggests this concept (it is concerned with notification only), and Applicants submit Nakagawa is also deficient of this claim element for

reasons stated above with regard to the discussion of claim 1. As a result, Applicants submit that claims 6 and 14 are allowable.

In section 12 of the Office Action, the Examiner rejects claims 17, 18, and 20-25 under Bodas, U.S. Publication 2004/0163001, in view of Nakagawa, U.S. Patent 6,990,593. Applicants respectfully traverse this rejection.

Applicants respectfully submit that claim 17 includes the claim element of “selectively powering down one or more computer servers based on a criticality value assigned to each of the one or more computer servers”. Neither the Bodas or Nakagawa references disclose nor suggest this necessary claim element. Bodas is concerned with monitoring only environmental parameters, and Nakagawa is also missing this necessary claim element (see discussion above with respect to claim 1). As a result, Applicants submit that claim 17 is allowable over the cited Bodas and Nakagawa references. Also, since claims 18 and 20-25 depend either directly or indirectly from claim 17, they are also now submitted as being in condition for allowance.

In section 13 of the Office Action, the Examiner rejects claim 19 under Bodas, U.S. Publication 2004/0163001, in view of Nakagawa, U.S. Patent 6,990,593. Applicants respectfully traverse this rejection.

Applicants respectfully submit that claim 19 depends directly from claim 17, and must incorporate all the limitations of this base claim. Neither the Bodas or Nakagawa reference provide the necessary claim element of “selectively powering down one or more computer servers based on a criticality value assigned to each of the one or more computer servers”. Bodas neither discloses nor suggests this concept (it is concerned only with the monitoring of environmental parameters), and Applicants submit Nakagawa is also deficient of this claim element for reasons stated above with regard to the discussion of claim 1. As a result, Applicants submit that claim 19 is allowable.

In section 14 of the Office Action, the Examiner rejects claim 28 under Bodas, U.S. Publication 2004/0163001 in view of Nakagawa, U.S. Patent 6,990,593, and Ewing et al. (hereinafter "Ewing"), U.S. Patent 5,949,974. Applicants respectfully traverse the rejection.

Applicants respectfully submit that claim 28 depends directly from claim 17, and must incorporate all the limitations of this base claim. Neither the Bodas, Nakagawa, or Ewing reference provide the necessary claim element of "selectively powering down one or more computer servers based on a criticality value assigned to each of the one or more computer servers". Bodas neither discloses nor suggests this concept (it is concerned only with the monitoring of environmental parameters), Ewing neither discloses nor suggests this concept (it is only concerned with SNMP traps), and Applicants submit Nakagawa is also deficient of this claim element for reasons stated above with regard to the discussion of claim 1. As a result, Applicants submit that claim 28 is allowable.

Appl. No. 10/687,285
Amdt. Dated July 10, 2006
Reply to Office Action of April 10, 2006

In view of the foregoing comments and amendments, the Applicants respectfully submit that all of the pending claims are in condition for allowance and that the application should be passed to issue. The Examiner is urged to call the undersigned at the below listed telephone number if, in the Examiner's opinion, such a phone conference would expedite or aid in the prosecution of this application.

I hereby certify that this correspondence is being filed electronically with the United States Postal Service addressed to:
Commissioner for Patents, P.O. Box 1450,
Alexandria, VA 22313-1450, on

July 10, 2006

(Date of Deposit)

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